

## CLAIMS

What is claimed is:

1. A gear shift device for bicycles having at least one derailleur, a first body adapted to be attached to a bicycle frame, and a second body that can be displaced with respect to the first body to cause the selective engagement of a bicycle chain on a number of sprockets, to achieve the various gears of the device, the device comprising:  
an electric actuator for displacing the second body relative to the first body; and  
a transducer mounted on the device for detecting a position of the second body relative to a position of the first body.
2. The device according to claim 1 wherein the transducer is a resistive transducer.
3. The device according to claim 1 wherein the transducer is a rotary potentiometer.
4. The device according to claim 1 wherein the transducer is a linear potentiometer.
5. The device according to claim 1 wherein the transducer is a magnetic transducer.
6. The device according to claim 1 wherein the transducer is a rotary magnetic transducer.
7. The device according to claim 1 wherein the transducer is a linear magnetic transducer.

8. The device according to claim 1 wherein the transducer is an optical transducer.

9. The device according to claim 1 wherein the transducer is a linear optical transducer.

10. The device according to claim 1 wherein the transducer is a rotary optical transducer.

11. A gear shift device for a bicycle having a transmission chain, a first body for attachment to a bicycle frame, and a second body, pivotably associated to the first body, which selectively engages the transmission chain, the device comprising:

an electric actuator mounted on the device that displaces the second body relative to the first body; and

a transducer mounted on the device that detects a relative position of the second body with respect to the first body.

12. The device according to claim 11 wherein the transducer is a potentiometer.

13. The device according to claim 11 wherein the transducer is a magnetic transducer.

14. The device according to claim 13 wherein the magnetic transducer is a linear magnetic transducer.

15. The device according to claim 11 wherein the transducer is an optical transducer.

16. The device according to claim 15 wherein the optical transducer is a rotary optical transducer.

17. A method for constructing a device which positions and determines the position of a transmission chain on a bicycle having a frame and a plurality of sprockets which are selectively engaged by the transmission chain, the method comprising:

attaching a first body on the bicycle frame in proximity to the plurality of sprockets;

pivotably associating a second body to the first body for selectively positioning the transmission chain on one of the plurality of sprockets;

attaching an electric actuator to the device which positions the second body relative to the first body for positioning the transmission chain;

attaching a transducer to the device for detecting a position of the second body relative to a position of the first body.

18. The method of claim 17 wherein the step of attaching the transducer comprises the step of attaching a potentiometer.

19. The method of claim 17 wherein the step of attaching the transducer comprises the step of attaching an optical transducer.

20. The method of claim 17 wherein the step of attaching the transducer comprises the step of attaching a magnetic transducer.